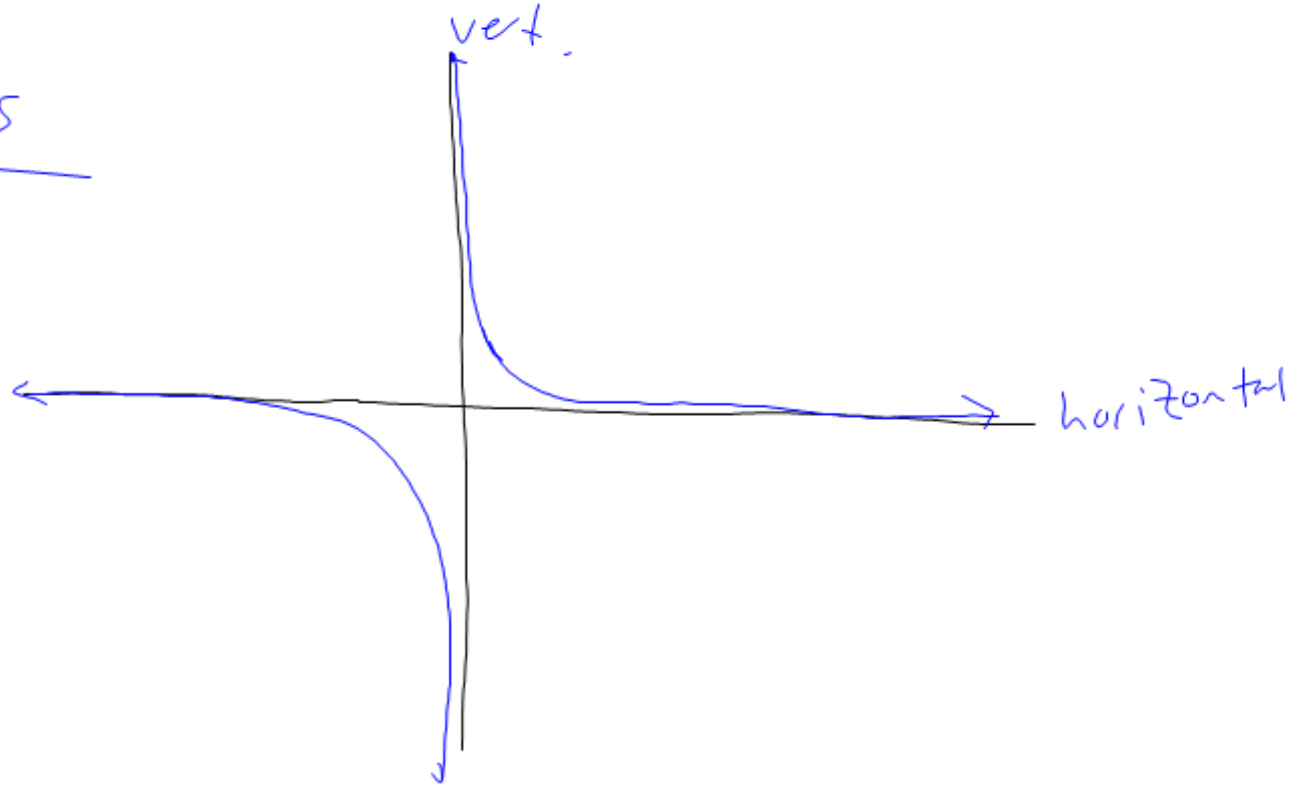
$$f(x) = \frac{1}{x}$$

x	-1000	-100	-1	0	1	100	1000	0.1	0.01
$f(x)$	-0.001	-0.01	-1	undef.	1	0.01	0.001	10	100

asymptotes



$f(x) = \frac{N(x)}{D(x)} = \frac{\text{some polynomial}}{\text{some polynomial}}$. ex $\frac{3x^3+5x^2+6}{2x^2+7x-8}$

① Vert. asymptotes happens at zeros of $D(x)$

② Horizontal Asymptotes (n is power of top, m is power bottom)

(a) If $n > m$, no horizontal asymptote

$\frac{x^2+4}{3x-1}$, grow out bound*

(b) If $m > n$, $y=0$ is the horz. asymptote

$\frac{3x-1}{x^2+4}$, as x grows, $D(x)$ gets much larger, overall approaches zero

(c) If $m = n$, horz asymptote at $y = \frac{\text{leading coefficient}}{\text{leading coefficient}}$

$\frac{3x^2-1}{x^2+4}$, has asymptote at $y = \frac{3}{1}$

Find all asymptotes – No Calc.

powers: bottom, top

(a) $f(x) = \frac{2x}{3x^2+1}$, horz. asymptotes $n > n$, so $y=0$ is horz. asymptotes

$3x^2+1=0$, -1 -1

$3x^2 = -1$

$\sqrt{x^2} = \sqrt{-\frac{1}{3}}$

non real

All $\mathbb{R}$

No vert. asymptotes

(b) $f(x) = \frac{2x^2}{x^2-1}$ horz $= \frac{2}{1}$

All $\mathbb{R}$ $x \neq \pm 1$

vert $= \pm 1$

$x^2 - 1 = 0$

$\sqrt{x^2} = \sqrt{1}$ $x = \pm\sqrt{1}$

(c) $f(x) = \frac{x^2+x-2}{x^2-x-6}$ horz $= \frac{1}{1}$

vert $= 3, \cancel{-2}$ hole

All $\mathbb{R}$ $x \neq -2, 3$

$\frac{(x+2)(x-1)}{(x+2)(x-3)}$

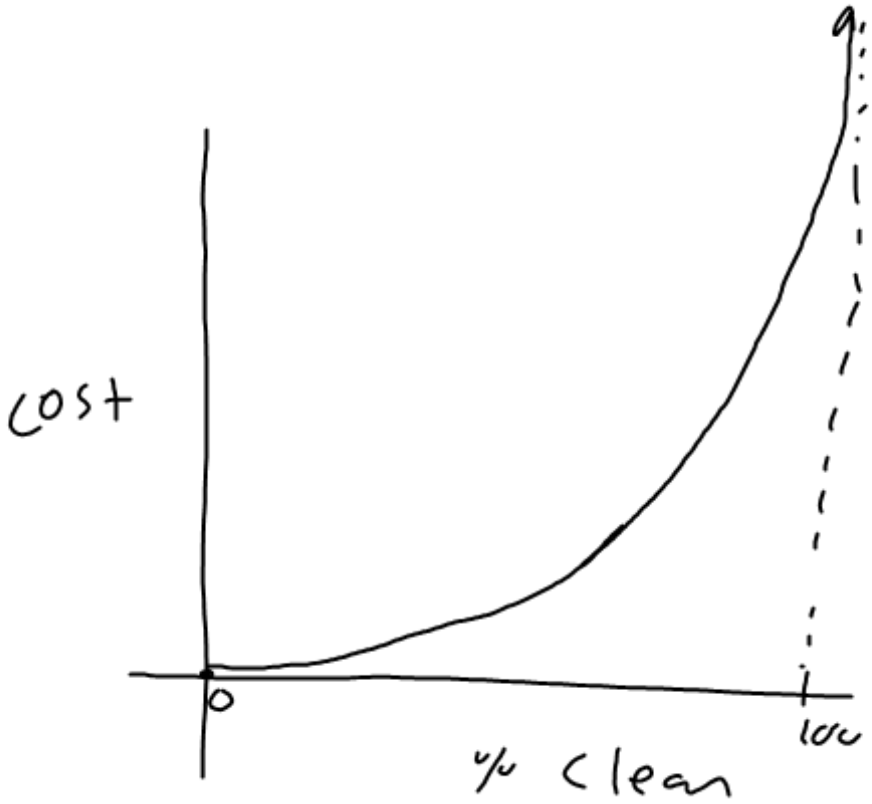
$f(x) = \frac{x-1}{x-3}$

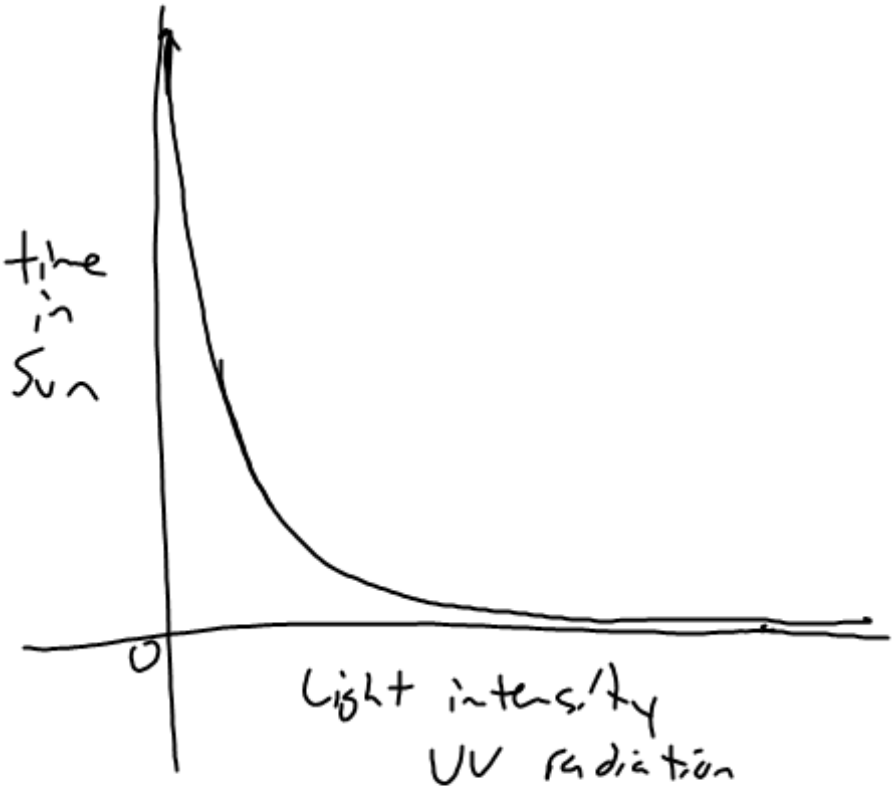
(d) $f(x) = \frac{3x^3+7x^2+2}{-4x^3+5}$ horz $= -\frac{3}{4}$, vert

$-4x^3+5=0$

$x = \sqrt[3]{\frac{5}{4}}$

all $\mathbb{R}$ $x \neq \sqrt[3]{\frac{5}{4}}$


cost
0
100
% clean


time in Sun
0
Light intensity
UV radiation

Sect. 2.6

#1-6 b+c, 7-12 matching NO CALC

HW

#13-21 (odd), 23, 27, 28, 31-34

Zeros of f(x) are the zeros of the top, unless one is an asymptote